

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
10 June 2004 (10.06.2004)

PCT

(10) International Publication Number  
**WO 2004/048924 A3**

(51) International Patent Classification<sup>7</sup>: **G01N 21/71**,  
24/00, 27/00

(21) International Application Number:  
PCT/US2003/036183

(22) International Filing Date:  
14 November 2003 (14.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/428,561 22 November 2002 (22.11.2002) US

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): **THE REGENTS OF THE UNIVERSITY OF CALIFORNIA** [US/US]; 1111 Franklin St., Twelfth Floor, Oakland, CA 94607 (US).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **WEXLER, Anthony**, S. [US/US]; 806 Falcon Ave., Davis, CA 95616 (US).

(74) Agent: **PARK, Richard**; 508 Second St., Ste. 201, Davis, CA 95616 (US).

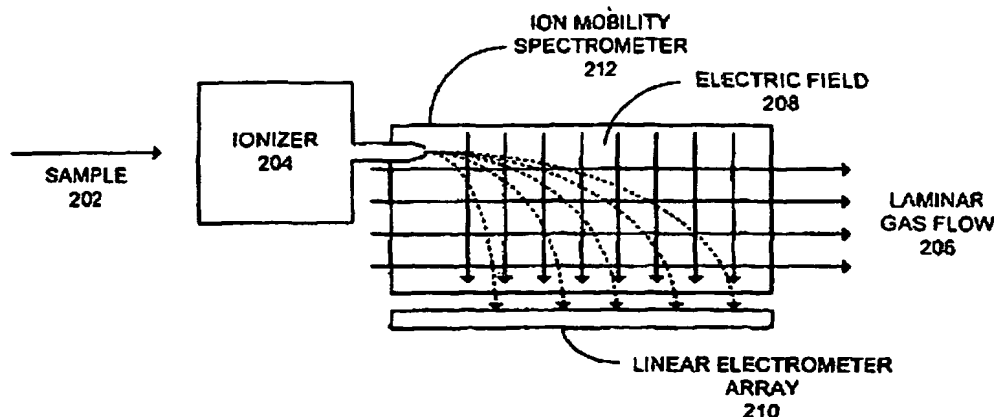
Published:

— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:  
12 August 2004

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHOD AND APPARATUS FOR PERFORMING ION MOBILITY SPECTROMETRY



(57) Abstract: New method and apparatus for performing ion or particle mobility spectrometry are disclosed. The method comprises ionizing a sample in an ionizer 204, injecting the ionized sample into a laminar gas flow 206 and applying an electric field 208 across the laminar gas flow. The combination of the laminar gas flow and the electric fields results in spatial separation of analyte ions based on ion mobility. The separated ions contact different elements of an electrometer array 210, with the output of the array being analysed to determine the mobility of the analyte ions.

WO 2004/048924 A3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/36183

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G01N 21/71, 24/00, 27/00

US CL : 436/153, 173; 422/98

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 436/153, 173; 422/98

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/022049 A2 (HALEY et al.) 29 MARCH 2001 (29.03.2001), the whole text	1-5, 7-8, 10-15, 17-11-5, 7-8, 20-25, 27-28, 30
X — Y	YONG et al. (US 3,902,064) 26 August 1975 (19.08.1995), Abstract, col. 2, lines 58-69	1-5, 7-8, 10-15, 17-11-5, 7-8, 20-25, 27-28, 30 ----- 9, 19, 29
X — Y	GUEVREMONT et al. Atmospheric Pressure Ion Trapping in a Tandem FAIMS-FAIMS Coupled to a TOFMS: Studies with Electrospray Generated Gramicidin S Ions", J. Am. Soc. Mass Spectrom., 12, 1320-1330 (2001).	1-5, 7-8, 10-15, 17-18, 20-25, 27-28, 30 ----- 6, 16, 26

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

11 June 2004 (11.06.2004)

Date of mailing of the international search report

23 JUN 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Yelena G. Gakh, Ph.D.

Telephone No. (571) 272-1700

*J. Unkufeld for*

**INTERNATIONAL SEARCH REPORT**

PCT/US03/36

**Continuation of B. FIELDS SEARCHED Item 3:**  
EAST, STN, Google

ion mobility spectrometer electrometer array